Cat vs Dog Classifier - CNN Web App

This project is a full-stack web application that uses a **Convolutional Neural Network (CNN)** to classify uploaded images as either a **cat** or a **dog**.

Overview

Users can upload an image (JPG/PNG), and the system will classify it as either a cat or dog using a trained deep learning model. The model is served through a **Flask backend**, and the interface is built with HTML, CSS, and JavaScript. The app is deployed and hosted publicly for anyone to try.

Neural Network Architecture

The CNN model was built using **TensorFlow/Keras** and trained on a dataset of over **25,000 images** from the Kaggle Dogs vs. Cats dataset.

 The model takes a **128×128 RGB image** as input and outputs a binary classification (0 = Cat, 1 = Dog).

Model Summary:

Layer (Type)	Output Shape	Parameters
Conv2D (32 filters)	(126, 126, 32)	896
MaxPooling2D	(63, 63, 32)	0
Conv2D (64 filters)	(61, 61, 64)	18,496
MaxPooling2D	(30, 30, 64)	0
Conv2D (128 filters)	(28, 28, 128)	73,856
MaxPooling2D	(14, 14, 128)	0
Flatten	(25088,)	0
Dense (128 units)	(128,)	3,211,392
Dropout (0.5)	(128,)	0

| Dense (1 unit) | (1,) | 129 |

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  Total Parameters: 3,304,769

- **Activation Functions:** ReLU (hidden layers), Sigmoid (output layer)

- **Loss Function:** Binary Crossentropy

- **Optimizer:** Adam

- **Accuracy:** ~80% on validation set

Tech Stack

- **Frontend:** HTML, CSS, JavaScript

- **Backend:** Python, Flask

- **Model:** TensorFlow / Keras (.h5 model file)

- **Deployment:** Render.com

- **Version Control:** Git & GitHub

Features

- Upload and classify image as Cat or Dog.

- Clean, responsive frontend layout.

- Uses a deep learning model trained on real-world images.

- Fast prediction with visual feedback.

- Deployed online, accessible via browser.

📁 Project Structure for Render Deployment

```
cat-vs-dog-classifier/
│
├── app.py              # Flask backend logic
├── catVdogCNN.h5       # Trained CNN model
├── requirements.txt    # Python dependencies
├── static/             # Static files: CSS, JS, images
│   ├── style.css
│   └── script.js
├── templates/          # HTML template
│   └── index.html
```

🌐 Live Demo

🔗 [Try the App Live](#)